

Math anxiety factors into understanding genetically modified food messages

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People who feel intimidated by math may be less able to understand messages about genetically modified foods and other health-related information, according to researchers.

"Math anxiety, which happens when people are worried or are concerned about using math or statistics, leads to less effort and decreases the ability to do math," said Roxanne Parrott, Distinguished Professor of Communication Arts and Sciences and Health Policy and Administration. "Math anxiety also has been found to impair working memory."

The researchers found that [math anxiety](#) led to a decrease in comprehension for people who read statistics in a message about genetically modified foods, while an increase in skills in math and a confidence in those skills led to better comprehension.

"This is the first study that we know of to take math anxiety to a health and risk setting," said Parrott. "Math skills have become a common element in many health and risk message studies, which addresses the skill component of math competence but ignores the cognitive and affective components."

People who have lower levels of math skills and who have less confidence in their ability to do math had higher levels of math anxiety, said Parrott, who worked with Kami J. Silk, professor of communication, Michigan State University.

However, math anxiety also increased for people who had high levels in both math skills and their belief in those math-solving skills when exposed to a message about genetically modified foods. The math anxiety in high-skilled individuals did not significantly affect the understanding of the message.

"Perhaps this is due to performance anxiety," Parrott said. "It's a sense of 'I know I can do it and I have the skills to do it, but it is making me anxious to apply my skills.'"

Participants also reported they believed that statistics presented in messages were more important than those presented on a bar graph, according to the researchers. The perceived level of importance of the messages may make text more persuasive than graphics.

The study underscores the need to not only improve math skills, but also confidence in one's skills.

The study also emphasizes that anxiety about facing tasks that require math or statistics skills likely reduces efforts to understand consumer warnings and other health information that relies on numbers.

"This is one more piece of evidence about the importance of applied math education, in which students tackle real world messages and content when learning math skills," said Parrott. "We have to focus on teaching people math, but also we need to tell people that they do have the skills, and find strategic ways to communicate that ease anxiety and worry about understanding math."

The researchers, who reported their findings in the online issue of the *Journal of Health Communication*, recruited 323 university students for the study. The participants were randomly assigned a message that was altered to contain one of three different ways of presenting the statistics:

a text with percentages, bar graph and both text and graphs. The statistics were related to three different messages on genetically modified foods, including the results of an animal study, a Brazil nut study and a food recall announcement.

Researchers measured the participants' [math skills](#), confidence and anxiety prior to reading the message. After the test, the researchers again measured the participants' levels of math anxiety, as well as other abilities, including their comprehension, sense of the message's importance and intentions.

Parrott said that future research should determine whether math anxiety plays a similar role in other types of health risk messages. The researchers investigated genetically modified food messages because the topic is currently in the news and developing smart policies on food acquisition and safety is increasing.

"My goal is to help people make informed decisions and to do that, they need to understand and comprehend messages," said Parrott. "Food policy, in particular, interests me because having enough food to feed people is a really big issue that we're facing."

Provided by Pennsylvania State University

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